ABSTRACT

A biomass gasifier apparatus (10) produces low BTU gas from biomass, while removing the char and ash in an efficient manner. A fluidized bed gasifier cell (20) receives biomass fuel from a fuel input system (280). A preferred fluidized bed gasifier cell includes a vertically oriented cylindrical enclosure. A layer of bed material (40), typically having a consistency similar to sand, is carried at the base of the enclosure. A plenum (60) supplies hot compressed gas to a plurality of parallel manifolds (80), each of which support a number of nozzles (100). Gas released by the nozzles fluidizes the bed, catalyzing the process of gasification of the biomass, while a low oxygen environment prevents excessive combustion. A bed change-out system (120) removes waste introduced into the fluidized bed gasifier with the biomass. Gas discharged from an upper portion of the fluidized bed gasifier includes low BTU gas that is the desired output of the system. In a preferred application, this gas is injected into a cyclone (140). An upper portion of the cyclone discharges low BTU gas at high-temperature, for use in a boiler or other application, often along with a fossil fuel.